Department of LABOR AND INDUSTRIES

ELECTRICAL CURRENTS

Code guidance from the Department of Labor and Industries
Office of the Chief Electrical Inspector

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Our 7th month! Electrical code issues and answers.

● Equipment ground required in flex when installation requires flexibility

NEC 250-91(b) and the exceptions allow the use of flexible metal conduit for grounding when both the conduit and the fittings are listed for grounding and the total ground return path does not exceed 6 ft. (1.83m). NEC 350-14 and NEC 351-9 require that: *"Where used to connect equipment where flexibility is required, an equipment grounding conductor shall be installed."* Therefore, anytime flexible metal conduit or liquid tight flexible metal conduit is installed in any length to provide flexibility such as to supply motors and adjustable equipment an equipment grounding conductor must be installed.

● WAC 296-46-23040(4) - Additional service laterals to multiple-occupancy buildings

Recently an interpretation was requested for WAC 296-36-23040(4)(b) - accepting multiple service laterals for multiple-occupancy buildings. This WAC allows the department to accept additional service laterals if conditions (a) through (e) are met. Condition (b) states that *"each service lateral terminates in service equipment that is located in or on a unit served by the service equipment."* The question of interpretation is whether a service lateral is allowed to "terminate" in a meter base or CT can. The service entrance conductors would then terminate in the "service equipment" that is located in or on the unit.

What have we done in the past? A polling of the supervisors shows that our interpretation and enforcement of this rule has been inconsistent. Some regions have allowed additional service laterals to terminate in a meter or CT enclosure on the inside or outside of the building. Others have required a combination meter base and main breaker on the outside or inside of the building.

What is unsafe about terminating in a meter base or CT enclosure in this situation? A single service lateral is allowed to terminate in a meter base or CT can. We approve these installations all of the time. Even the exception to WAC 296-46-23040(4) allows the service laterals to terminate in *"meter enclosures that are permitted to be less than 15 feet apart"* for duplexes.

Many inspectors have used the 1996 code revision to NEC 230-66 as the basis for a decision on WAC 296-46-23040(4). The revision states that *"Individual meter socket enclosures shall not be considered service equipment."* This change was **not** made to exclude metering equipment from the termination of service laterals or service entrance conductors or otherwise prohibit the use of such equipment in services. The NEC Technical Correlating Committee added this statement to NEC 230-66, to comply with the Manual of Style, when the Fine Print Note (FPN) to NEC 230-83 was removed. The old FPN stated *"It is not the intent of this section to require individual meter socket enclosures to be suitable for use as service equipment."* The revision to NEC 230-66 dealt with the **marking** of meter equipment, not the use.

What is safe and what makes sense? The responsibility of the Chief Electrical Inspector is to interpret standards, rules, and policies to provide consistency for our program. The interpretation of this section will be that the department will accept additional service laterals if conditions (a) through (e) are met. For condition (b) service laterals may terminate in a listed meter enclosure or CT can. The service entrance conductors must then terminate in listed service equipment. This interpretation is effective immediately. WAC 296-46-23040 will be revised to reflect this interpretation in our next WAC revision cycle.

● Conduit, cables, or nonmetallic underground conduit with conductors (NEC 343) installed with a trenching machine

The same inspection rules we apply to ditch cover would apply to this installation method as well. RCW 19.28.210(4) requires that *"No electrical wiring or equipment subject to this chapter may be concealed until it has been approved by the inspector making the inspection."* Electrical conduit and wiring cannot be covered until visually inspected by an electrical inspector. Since the material is being installed to a required depth and covered at the same time, other arrangements will be necessary. The inspector will be called to observe the process at the

outset and then check the process as often as he or she deems necessary to insure that the installation is meeting the intent of the code. Just because the machine has the capability to place and cover at the same time does not mean the installation can be done without inspection approval. In all cases, the field inspector has discretion to allow partial cover of buried raceways and conductors for safety reasons.

The installation of conduit and/or wiring, whether done with a machine or not, must be performed by a certified electrician. If a machine is laying conduit or conductors, a certified electrician must be continuously present and directly involved in the installation. The Electrical Board has consistently made the decision that electrical conduit or conductors require a certified electrician to do the installation. If an individual was only **digging** the ditch he/she would not have to be a certified electrician.

● Wiring methods in medical, dental or chiropractic offices or clinics, outpatient or ambulatory surgical clinics, and other such health care occupancies.

Although many of these health care facilities do not require plan review, portions of them are likely to require the special wiring methods of NEC Article 517. Patient Care Areas are defined as *"Any portion of a health care facility wherein patients are intended to be examined or treated. Areas of a health care facility in which patient care is administered are classified as general care areas, critical care areas, either of which may be classified as a wet location."* All of the above occupancies are likely to contain general care areas which *"are patient bedrooms, examining rooms, treatment rooms, clinics, and similar areas in which it is intended that the patient shall come in contact with ordinary appliances such as a nurse call system, electrical beds, examining lamps, telephone, and entertainment devices. In such areas, it may also be intended that patients be connected to electromedical devices (such as heating pads, electrocardiographs, drainage pumps, monitors, otoscopes, opthalmoscopes, intravenous lines, etc.)"*

NEC 517-13 requires an insulated copper conductor to ground receptacles and fixed equipment in patient care areas. This insulated grounding conductor (and the branch-circuit conductors) must be installed in a metal raceway or, by exception, in types MI, MC, or AC cables. If such cables are used, the outer metal armor or sheath must be identified as an acceptable ground return path. For metal-clad cable (MC) or armored cable (AC) this identification is "Hospital Grade." Flexible metal conduit in lengths exceeding six feet of total ground return path does not meet the requirement for metal raceway. See NEC 517-13(a&b) for additional details on these and other branch-circuits in patient care areas.

● Mobile home feeder wiring method requirements

NEC 550-24 requires that four insulated and color coded conductors of adequate ampacity be installed to feed a mobile home. It further states that the equipment grounding conductor cannot be identified by stripping the insulation from the conductor.

All applicable requirements found in Chapter 3 must be complied with when installing a feeder to a mobile home. These requirements include but are not limited to: proper depth of direct burial conductors and physical protection of conductors to that depth, conductors and raceways must be a type approved for the application, and any raceways installed must meet all installation requirements for supporting and securing.

● New fees for swimming pools, hot tubs, spas, and septic pumping systems

The statutory authority of the electrical inspection program includes the requirement that permit fees cover the entire cost of performing electrical inspections. We have added new inspection fees for specialty electrical items (swimming pools, hot tubs, spas, saunas, and septic pumping systems) that require additional inspection time or inspection trips to a job site.

The fee schedule lists different fees for these specialty items inspected *"with the service"*, and *"at the same time"* as the service. The reduced fees will be applicable when the inspection items are indicated and paid for on the same permit as the rest of the building wiring. If paid for at the lower rate, it is intended that swimming pools, hot tubs, spas, saunas, and septic pumping systems can be inspected during the normal number of progress inspections allowed for the permit. If there is no other work except a specialty item or, an additional trip is required specifically for a specialty item, it will be charged at the greater fee. Specialty items that are not included when purchasing the original electrical permit will also be charged at the greater fee.

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